

REMARKS

Claims 1 through 14 are pending in this Application. Applicant acknowledges, with appreciation, the Examiner's indication that claims 2 through 7 and 10 through 12 contain allowable subject matter. Claims 2 and 10 have been amended by placing them in independent form. Accordingly, the only remaining issues pivot about the patentability of claims 1, 8, 9, 13 and 14.

Claim 1 has been amended to clarify that inlaid copper means copper filling an opening in the dielectric layer, adequate descriptive support for which should be apparent throughout the originally filed disclosure, as, for example, page 5 of the written description of the specification, lines 13 et seq., and page 7, lines 14 et seq. Applicant submits that the present Amendment does not generate any new matter issue.

Claim 1 was rejected under 35 U.S.C. §102 for lack of novelty as evidenced by Lee et al.

In the statement of the rejection, the Examiner referred to column 4 of Lee et al., lines 1 through 4. This rejection is traversed as factually erroneous.

The factual determination of lack of novelty under 35 U.S.C. §102 requires the identical disclosure in a single reference of each element of a claimed invention such that the identically claimed invention is placed into the recognized position of one having ordinary skill in the art. *Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358 (Fed. Cir. 2003); *Crown Operations International Ltd. v. Solutia Inc.*, 289 F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002). There is a fundamental difference between the claimed method and the methodology of Lee et al. that scotches the factual determination that Lee et al. disclose a method identically corresponding to that claimed.

Specifically, as argued in the response submitted June 9, 2003, even before the present Amendment, independent claim 1 required the manipulative step of “. . . forming a wafer containing inlaid copper (Cu) or a Cu alloy”. That manipulative step is neither disclosed nor suggested by Lee et al., even in column 4 identified by the Examiner, lines 1 through 4, which relate to laser treating a surface of a heat sink which is **on** a wafer and exposed. That is not **inlaid copper** as would have been understood by one having ordinary skill in the art. *In re Cortright*, 165 F.3d1353, 49 USPQ2d 1464 (Fed. Cir. 1999).

At any rate, claim 1 has been amended by clarifying that the wafer contains Cu or a Cu alloy “filling an opening formed in a dielectric layer”. Certainly, Lee et al. do not relate to semiconductor devices wherein Cu fills an opening in the dielectric layer. Rather, Lee et al. simply relate to a copper heat sink **on** a semiconductor wafer.

Moreover, Applicant submits herewith, as Exhibit I, a declaration pursuant to 37 C.F.R. §131 predating the effective date of Lee et al. of June 5, 2001.

The above argued differences in manipulative steps between the claimed method and the methodology of Lee et al. undermine the factual determination that Lee et al. disclose a method identically corresponding to that claimed. *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986). Moreover, the declaration under 37 C.F.R. §131 effectively removes the reference to Lee et al. as prior art.

Based upon the foregoing, Applicant submits that the imposed rejection of claim 1 under 35 U.S.C. §102 for lack of novelty as evidenced by Lee et al. is not factually viable and, hence, solicits withdrawal thereof.

Claims 13 and 14 were rejected under 35 U.S.C. §103 for obviousness predicated upon Lee et al.

Claims 8 and 9 were rejected under 35 U.S.C. §103 for obviousness predicated upon Lee et al. in view of Pramanick et al.

Each of the above rejections under 35 U.S.C. §103 is traversed. Specifically, claims 8, 9, 13 and 14 depend from independent claim 1. Applicant incorporates herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. §102 for lack of novelty as evidenced by Lee et al. The Examiner's additional remarks and secondary reference to Pramanick et al. do not cure the argued deficiencies of Lee et al.

Applicant, therefore, submits that the imposed rejection of claims 13 and 14 under 35 U.S.C. §103 for obviousness predicated upon Lee et al. and the imposed rejection of claims 8 and 9 under 35 U.S.C. §103 for obviousness predicated upon Lee et al. in view of Pramanick et al. are not factually or legally viable and, hence, solicits withdrawal thereof.

Applicant again acknowledges, with appreciation, the Examiner's indication that claims 2 through 7 and 10 through 12 contain allowable subject matter. Based upon the arguments submitted above, it should be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

10/079,517

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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Date: November 7, 2003



Docket No.: 50432-234

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Minh Van NGO

Serial No.: 10/079,517

Filed: February 22, 2002

For: USING LTA/NH3 OR H2 T REMOVE CUO FOR BETTER ADHESION OF CU
AND SIN CAPPING

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Group Art Unit: 1742

Examiner: George P. Wyszomeirski

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DECLARATION UNDER 37 CFR §1.131

Mail Stop
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

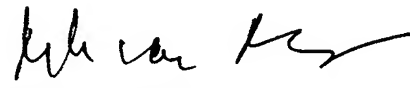
I, Min Van Ngo, hereby declare that:

1. I am the inventor of the invention disclosed and claimed in the above-referenced United States patent application.
2. I am aware of the prosecution history of this application which was filed in the U.S. Patent and Trademark Office on February 22, 2002. I am also aware that certain claims were rejected under 35 USC §102 for lack of novelty or under 35 USC §103 for obviousness predicated upon U.S. Patent No. 6,429,049 issued to Lee et al. on August 6, 2002 based upon an application filed in the United States Patent and Trademark Office on June 5, 2001.

3. To my knowledge and in view of the factual evidence supplied herewith, the present invention was conceived in the United States prior to June 5, 2001, the filing date of the Lee et al. application. This fact is evidenced by the attached laboratory notebook entry and the invention disclosure submitted to Advanced Micro Devices, Inc. (AMD), the assignee herein (Exhibit A hereto). Due diligence was exercised from prior to the June 5, 2001 filing date of the Lee et al. application to the filing date of the present application on February 22, 2002.

4. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

6-13-03
Date


Minh Van Ngo

TOPIC: Application Of LTA To Novel Devices

AMD INVENTION DISCLOSURE

TLD ID#

60296

Rec'd date

Sunnyvale x42110, return to MS68,

Texas x55964 return to MS562

Project: ☐, Product: ☐, Process: ☐, Technology ☐, to which the invention applies (identify):

List 2 to 5 key words useful to search by to find patents or art related to this invention:

Working title of invention:

Using LTA / NH₃ or H₂ to remove CuO
for better adhesion of Cu & SiN copy

INVENTOR/SESSION PARTICIPANT ADDRESS INFORMATION IS ON THE NEXT PAGE (1A)

Inventor's signature: _____ date: _____

Inventor's printed full name: Hinh Van Ngo Citizenship: _____

Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____

Division: _____ Directorate: _____ Dept #: _____ Dept : _____ Manager: _____

Residence address: _____

Post Office address: _____

Co-Inventor's signature: _____ date: _____

Co-Inventor's printed full name: _____ Citizenship: _____

Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____

Division: _____ Directorate: _____ Dept #: _____ Dept : _____ Manager: _____

Residence address: _____

Post Office address: _____

Co-Inventor's signature: _____ date: _____

Co-Inventor's printed full name: _____ Citizenship: _____

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Division: _____ Directorate: _____ Dept #: _____ Dept : _____ Manager: _____

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Post Office address: _____

Co-Inventor's signature: _____ date: _____

Co-Inventor's printed full name: _____ Citizenship: _____

Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____

Division: _____ Directorate: _____ Dept #: _____ Dept : _____ Manager: _____

Residence address: _____

Post Office address: _____

List on additional sheet if there are more co-inventors and list total number of inventors here: _____

Name(s) of attorney(s) preferred by inventor(s) to prepare patent application, if known:

LAW FIRM: MCDERMOTT, WILL & EMERY

ATTORNEY: Arthur J. Steiner

Witness 1 initial: _____ Witness 2 initial: _____

50432-234

G0296 → G0296

AMD INVENTION DISCLOSURE

California x42110, return to MS68,

Texas x55964 return to MS562,

TLD ID#

Rec'd date

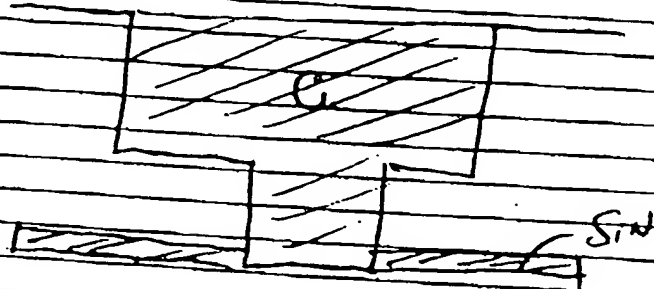
Dresden x83401 Silke Kretzschmar at MS E21-PP.

State the problem solved by this invention:

To totally reduce CuO.

Brief description and/or sketch of invention (please attach copies of AMD patent notebook pages, reports or drawings):

↓ LTA/ NH_3
or LTA/ H_2



After Cu etched, there is Cu oxide on top of Cu surface. Need to reduce this CuO for better adhesion between Cu/SiN capping interface.

Quickly LTA/ NH_3 or LTA/ H_2 @ 400°C to remove this CuO. Advantage also with short time is Cu will not reduction before SiN capping deposition.

Patent notebook # _____ Page numbers _____

Witness 1 initial: _____

Witness 2 initial: _____

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